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Comparison of the efficacies of crystallized phenol treatment and silver nitrate in the treatment of pilonidal sinus disease

Two alternatives in pilonidal sinus treatment

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Abstract

Aim: Pilonidal sinus is a disease localized in the sacrococcygeal region that mostly affects young adults and men and can be treated with conservative treatment methods. In this context, the objective of this study is to compare the efficacies of crystallized phenol and silver nitrate applications, two of the conservative treatment methods used in the treatment of pilonidal sinus disease.

Material and Methods: The sample of this retrospective clinical study consisted of 90 patients diagnosed with pilonidal sinus disease and treated nonoperatively.

Results: The primary complaints of the patients were discharge, pain and swelling. The mean age of the patients treated with crystallized phenol and silver nitrate was 22.5 (±7.5) and 25 (±7.5) years, respectively. Of the 90 patients, 42 (46.7%) had 2 sinus cavities, 18 (20%) had 3, 17 (18.9%) had 1, and 13 (14%) had 4. The number of times the treatment procedure was repeated was significantly higher in the silver nitrate group than in the crystallized phenol group [(2.95 (±1.3) vs. 2.22 (±0.82)].

Discussion: In conclusion, the silver nitrate treatment is an alternative treatment method to the crystallized phenol treatment or may even be the ideal treatment method in the treatment of pilonidal sinus.

Keywords

Pilonidal Sinüs, Silver Nitrate, Phenol

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This study was approved by the Ethics Committee of Necmettin Erbakan University (Date: 2020-12-18, No: 2951)

Introduction

Pilonidal sinus disease is a symptom complex that is frequently localized in the sacrococcygeal region and affects young adults more, leading to cyst and abscess formation from the skin depression or sinus formation as a result of the chronic infection. Many theories featuring congenital and acquired causes have come to the fore in the etiology of the pilonidal sinus disease. Today, the theory featuring acquired causes is more prominent in the development of pilonidal sinus disease [1, 2]. Pilonidal sinus is observed 6 to 7 times more frequently in men compared to women [3].

Many surgical and conservative methods have been used to date in the treatment of pilonidal sinus disease. However, some of the surgical treatment methods cause more postoperative problems than the problems caused by the pilonidal sinus disease, that is, the morbidity of the surgery can take precedence over the morbidity of the disease itself [4]. The ideal treatment for pilonidal sinus disease should be a simple method with less recurrence rate, complications, pain, and need for wound care, short hospitalization time, and low treatment cost which allows returning to normal life in a short time. Nevertheless, there is still no consensus about an ideal treatment method that meets these criteria.

One of the most common conservative treatment methods used in the treatment of pilonidal sinus involves the application of crystallized phenol, the efficacy of which has been proven by many studies. The main purpose of applying crystallized phenol is to irritate the sinus cavity with phenol, a sclerosing substance, and fill it with granulation tissue. Nonetheless, this treatment method is reportedly associated with recurrence rates of 18.6% [5].

Another conservative treatment method used in the treatment of pilonidal sinus involves the application of silver nitrate, a lytic agent that is widely used in dressings and wound care products aimed at the treatment of difficult wounds [6, 7]. It has been demonstrated that silver nitrate causes epithelial cell destruction and accelerates wound healing by eliminating excess granulation tissue that activates fibroblasts in various clinical conditions such as perianal fistula and sinus [8].

In view of the foregoing, the objective of this study is to compare the efficacies of crystallized phenol and silver nitrate applications, two of the conservative treatment methods used in the treatment of pilonidal sinus disease.

Material and Methods

This retrospective clinical study study was carried out in Necmettin Erbakan University Meram Medical Faculty Hospital General Surgery Clinic. All patients were informed in detail about the procedure to be performed. The consent form was obtained from all patients.

The study's population included cases who were diagnosed with pilonidal sinus disease and received nonoperative treatment at the General Surgery Polyclinics of Meram Medical Faculty Hospital between February 2017 and May 2021. Patients younger than 18 and older than 65, patients who smoke, have chronic diseases (e.g., diabetes and chronic obstructive pulmonary disease (COPD), etc.) were not included in the study. In the end, the study sample consisted of 90 patients. Patients' demographic characteristics, including age and gender, clinical characteristics including their pilonidal sinus disease-related complaints, duration of the pilonidal sinus disease, the number of sinus cavities they had, the number of procedures they received, and whether complications developed after the procedure were recorded. Patients were randomly assigned to crystallized phenol or silver nitrate treatment groups according to the date when they were first admitted to the hospital. The treatment processes and the number of procedures administered to the patients participating in the study were recorded in detail.

Crystallized Phenol Treatment

The patients were advised to clean the hair in the sacrococcygeal region the day before the procedure. Crystallized phenol was applied while the patients were in prone position under local anesthesia in the intervention room. The sinus orifice was widened with the help of a clamp, and the hairs and debris were removed (Figures 1&2). The skin around the external opening of the sinus was protected with 0.2% nitrofurazone ointment. Phenol crystals were placed into the sinus with the help of a clamp from the widened orifice, filling the cavity completely. After they were kept in the sinus for 1-3 minutes, the sinus contents were cleaned again and curetted. The dressing was closed and the procedure was completed. After the procedure, the patients were sent home with the recommendation to continue hair removal in the sacrococcygeal region and come to the hospital for a follow-up visit in three weeks.

Silver Nitrate Treatment

As with the crystallized phenol treatment, local anesthesia was applied to the area to be treated after the sacrococcygeal hair was cleaned. The sinus orifice, which the silver nitrate stick could not reach, was widened with the help of a clamp and the hairs and debris were removed (Figures 1&2). The same procedure was repeated for each patient with more than one sinus orifice. The skin was protected with 0.2% nitrofurazone ointment to prevent the irritating effects of the silver nitrate stick. A silver nitrate stick was placed in the widened orifice. A separate stick was used for each sinus cavity in patients with more than one sinus cavity. The silver nitrate stick was left inside for 1-2 minutes. Afterwards, the necrotic tissue and hairs formed in the orifice were cleaned and covered with a dressing and the procedure was completed. After the procedure, the patients were sent home with the recommendation to continue hair removal in the sacrococcygeal region, come to the hospital for a follow-up visit in three weeks, and not to take a bath in the first 24 hours after the procedure.

Follow-up

Patients who received crystallized phenol and silver nitrate treatments were called to the hospital for follow-up visits at 3-week intervals after the procedure. In the control examinations, patients were asked about whether their complaints regressed. In the physical examination, whether patients' condition improved was evaluated and the result of this evaluation was recorded. The treatment was terminated in patients who recovered and they were asked to come to the hospital for a follow-up visit in 6 months. The patients whose overall complaints regressed but discharge and consequent maceration around the sinus persisted, and patients with no granulation in the sinus were considered to have insufficient recovery. The procedure was repeated in patients with insufficient recovery or no recovery. After the procedure, the patients were called for follow-up visits at 3-week intervals.

Failure to detect improvement during the control examinations performed at the one-year follow-up visits in both treatment groups was considered as “treatment failure”. Disappearance of complaints, complete closure of the sinus cavity, and absence of discharge were considered as complete recovery. Recurrence of symptoms and detection of sinus formation on physical examination after complete recovery was considered as “relapse”.

Ethical Approval

This study was approved by the Ethics Committee of Necmettin Erbakan University (Date: 2020-12-18, No: 2951).

Results

A total of 90 patients, 75 (83.3%) male and 15 (16.7%) female, were included in the study. Of these patients, 50 were treated with crystallized phenol and 40 with silver nitrate. The mean age of the patients treated with crystallized phenol and silver nitrate was 22.5 (±7.5) and 25 (±7.5) years, respectively. There was no statistically significant difference between the groups in terms of age (p=0.096). Of the male patients, 39 (52%) were treated with crystallized phenol and 36 (48%) with silver nitrate, and of the female patients, 11 (73%) were treated with crystallized phenol and 4 (26.7%) with silver nitrate. There was no significant difference between the groups in terms of gender (p=0.129) (Table 1). Thirty-four (37.8%) patients had discharge complaints, and 30 (33.3%) patients had both discharge and pain complaints. There was no significant difference between the groups in terms of the rates of patients with complaints (p=0.173)

As for the duration of disease-related complaints, it was determined that 27 (30%) patients had complaints for 12 to 24 months, and 22 (24.4%) patients had complaints for more than 24 months (Table 1).

In terms of the number of sinuses, 42 (46.7%) had 2 sinus cavities, 18 (20%) had 3, 17 (18.9%) had 1, and 13 (14%) had 4. There was no statistically significant difference between the groups in the number of sinus cavities (p=0.275) (Table 1).

Within the scope of the control examinations performed during the one-year follow-up visits, it was determined that 46 (92%) patients in the crystallized phenol group recovered, whereas 2 (4%) did not recover, and 2 (4%) relapsed, and that 38 (95%) patients in the silver nitrate group recovered, 1 (2.5%) did not recover, 1 (2.5%) relapsed. There was no statistically significant difference between the groups in terms of patients’ recovery rates determined during the one-year follow-up visits (p=0.355) (Table 2).

The number of the treatment procedure that was repeated in the crystallized phenol and silver nitrate groups is shown in Table 3. The mean number of procedures applied was 2.22 (±0.82) in the crystallized phenol group and 2.95 (±1.3) in the silver nitrate group. The number the treatment procedure was repeated was significantly higher in the silver nitrate group than in the crystallized phenol group (p=0.003) (Table 3). Post-procedure hematoma, seroma, and wound infection did not develop in any of the patients in either group. None of the patients required any additional anesthesia other than local anesthesia. Bed rest was not recommended to any of the patients and no movement restriction was imposed.

Discussion

There has been much debate over whether pilonidal sinus disease is congenital or acquired. However, the general opinion today is that the disease is acquired [2]. In parallel, the patient’s anamneses taken within the scope of this study, the age of onset and the type of the disease-related complaints suggest that pilonidal sinus disease is acquired.

Table 2. Comparison of patients’ recovery rates determined during the one-year follow-up visits between the treatment groups

Groups	Complete Recovery n(%)	Treatment Failure n(%)	Relapse n(%)	p value
Crystallized Phenol Group	46 (%92)	2 (%4)	2 (%4)	0,852
Silver Nitrate Group	38 (%95)	1 (%2,5)	1 (%2,5)	

Table 1. Distribution of the age, gender, number of sinus cavities and disease-related complaints by the treatment groups

Variables		Crystallized Phenol Group (n=50)	Silver Nitrate Group (n=40)	p value
Age, median (years)		22,5 ±7,5	25 ±7,5	0,096
Gender, n (%)	Female	39 (%52)	36 (%48)	0,129
	Male	11 (%73)	4 (%26,7)	
The number of sinus cavities, n (%)				**p value**
1		13 (%76,5)	4 (%23,5)	0,275
2		22 (%52,4)	20 (%47,6)	
3		9 (%50)	9 (%50)	
4		6 (%46,2)	7 (%53,8)	
The duration of disease-related complaints, n(%)				**Total**
0 – 3 months		6 (%42,9)	8 (%57,1)	14 (%15,6)
3 – 6 months		5 (%45,5)	6 (%54,5)	11 (%12,2)
6 – 12 months		9 (%56,3)	7 (%43,8)	16 (%17,8)
12 – 24 months		17 (%63)	10 (%37)	27 (%30)
More than 24 months		13 (%59,1)	9 (%40,9)	22 (%24,4)

Table 3. Frequency of repeat treatment in each treatment group and comparison of groups

Groups	The number the treatment procedure repeated						The number the treatment procedure repeated, median ± S.D.	
	1 n (%)	2 n (%)	3 n (%)	4 n (%)	5 n (%)	6 n (%)		
Crystallized Phenol Group	11 (%22)	18 (%36)	21 (%42)	0	0	0	2,22 ± 0,82	P value 0,003
Silver Nitrate Group	2 (%5)	11 (%27,5)	13 (%32,5)	9 (%22,5)	3 (%7,5)	2 (%5)	2,95 ± 1,3	

S.D.: standard deviation

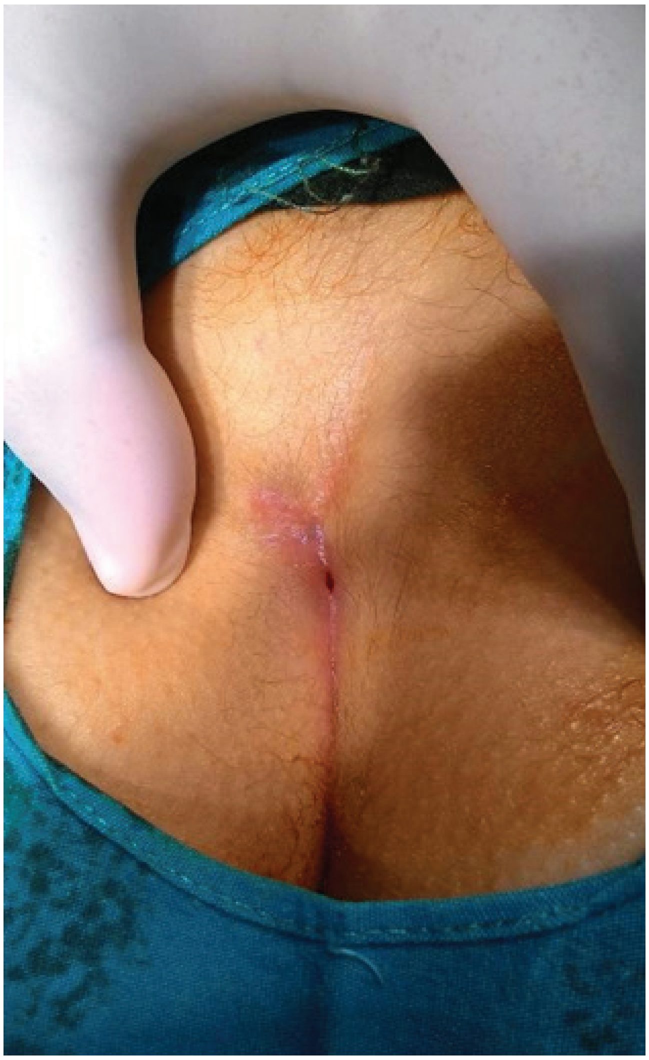

Figure 1. Pilonidal sinus cavity

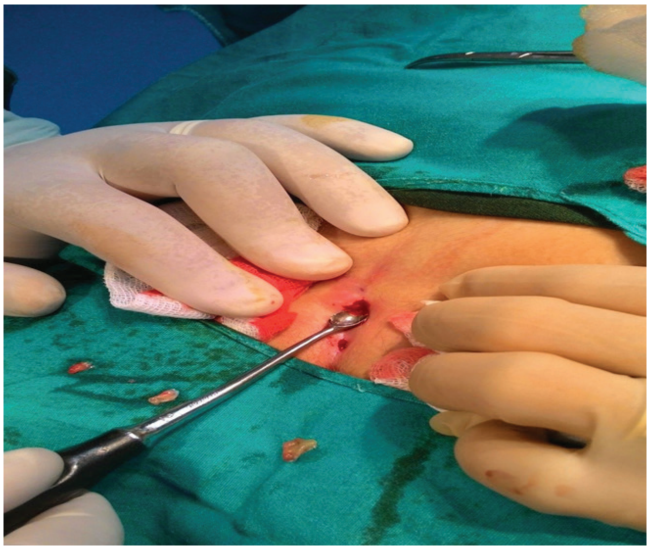

Figure 2. Removal of tissue debris by curetting of the sinus cavity

Pilonidal sinus disease is observed 6 to 7 times more frequently in men compared to women [3]. The incidence of the disease is reportedly higher in the 17-27 age group. In the literature, the mean age of onset of symptoms and the mean age of admission to hospital has been reported as 21 and 25, respectively [9]. In line with the literature, 75 of the 90 patients included in this study were male and 15 were female, indicating a 5:1 male/female ratio, and the mean age of onset of symptoms was 23.6 years.

In the literature, the success rate of crystallized phenol treatment varies between 70-95%, no complications were reported, and the recurrence rate was reported as 4.9% [10-12]. It has been shown that in the presence of an abscess, the first drainage of the abscess reduces recurrence [13]. Similarly, in this study, the success rate of crystallized phenol treatment was 92%, no complications were observed, and the recurrence rate was 4%.

Studies have reported that the success rate increases with the repetition of crystallized phenol treatment (52-53). In parallel, in this study, the success rate increased with the repetition of the crystallized phenol treatment. Accordingly, 11 (22%) patients recovered with one course of treatment, 18 (36%) with 2 courses of treatment, and 21 (42%) with 3 courses of treatment. Thus, patients received an average of 2.22 courses of treatment.

In a study involving 587 patients, the mean number of orifices in physical examination was reported as 2.71 (min.1, max. 9) [14]. In comparison, the mean number of orifices was calculated as 2.3 (min. 1, max. 4) in this study.

There are studies on nonoperative treatment of pilonidal sinus disease with different substances other than phenol. In a study including 400 cases, surgical treatment was compared with local Lawsonia inermis (henna) application and it was found to be quite successful in terms of both disease recurrence and return to work time [15]. There are not many studies in the literature on the use of silver nitrate in the treatment of

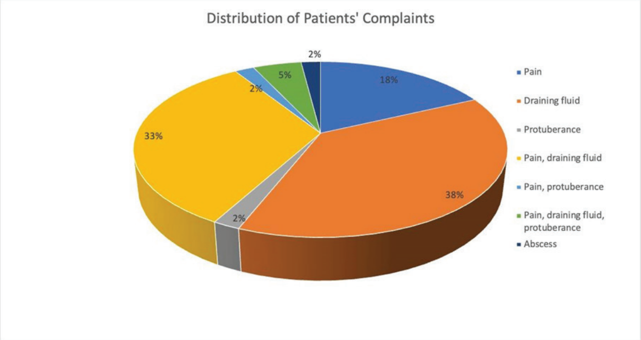

Figure 3. Distribution graph of patients' disease-related complaints

pilonidal sinus. Studies on the clinical use of silver nitrate seem to be insufficient. In this study, the success rate of silver nitrate treatment was found to be 95%. No complications were observed, and the recurrence rate was 2.5%. There was no statistically significant difference between the crystallized phenol and silver nitrate treatment groups in terms of patients' recovery rates determined during the one-year follow-up visits (p=0.355).

Doğru et al. [10] followed up the patients to whom they applied crystallized phenol for 24 months, and Ölmez et al. [11] followed up for 25 months. In comparison, the follow-up period in this study was one year, which was not sufficient to identify all relapsed patients. This relatively shorter follow-up period was the primary limitation of this study. Longer-term prospective randomized studies are needed to reach a conclusion about recurrence rates.

The use of silver nitrate in the treatment of pilonidal sinus has significant advantages, such as the fact that it can be applied to outpatients, does not require hospitalization, and enables full recovery early. In addition, it is a simple and straightforward method, associated with less pain, less need for wound care, and low treatment cost and allows returning to normal life in a short time.

The findings of this study demonstrated that the efficacy of silver nitrate treatment, which is a novel treatment method, is comparable to the generally accepted crystallized phenol treatment, the efficacy of which was established in the literature. Moreover, the silver nitrate treatment offers certain advantages over the crystallized phenol treatment as it causes less damage to healthy tissue, and is easier to apply and store.

Limitation

The small number of patients included in the study and the short follow-up period after the procedure are limitations of our study. Additionally, our study is single-centered. A multicenter study that includes a high number of cases and continues for a long follow-up period may provide more definitive findings on the subject.

Conclusion

Silver nitrate treatment is an alternative treatment method to crystallized phenol treatment, and it has even been concluded that it may be the ideal treatment method for the treatment of pilonidal sinus.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and Human Rights Statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or compareable ethical standards.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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